APPENDIX D
TRIM.FaTE Inputs

Input Parameter	Units
SOURCE DATA (for each source)	
Location of source	UTM coordinates (x,y)
Height of emission source	m
Emission rate (for each chemical)	g / s
Particle size	mm
BACKGROUND DATA (for each modeled chemical)	
Background concentration in each compartment	Soil and air: ng / m^3 Water: ng / l
METEOROLOGICAL DATA	
Horizontal wind speed	m / s
Horizontal wind direction	degrees
Vertical wind speed	m / s
Air temperature	°K
Precipitation	m / day
Mixing height	m
Relative humidity	unitless
SPATIAL DATA	
Corners of each volume element (VE)	UTM coordinates
Height of each air VE	m
Surface soil depth (for each surface soil VE)	m
Root zone depth (for each root zone VE)	m
Vadose zone depth (for each vadose zone VE)	m
Ground water layer depth (for each aquifer layer VE)	m
Surface water depth (for each surface water VE)	m
Sediment layer depth (for each sediment layer VE)	m
ABIOTIC ENVIRONMENTAL SETTING DATA	
Air (assume same for all air compartments)	
Atmospheric dust load	kg[dust] / m^3[air]
Dust density	kg[dust] / m^3[dust]
Dry deposition velocity of air particulates	m / day
Washout ratio	[mass chem/volume rain] / mass chem/volume air]
Surface area per volume of particles	m^2[area] / m^3[particles]
Junge_C	m-Pa
Density of air	g / cm^3
Fraction organic matter on particulates	unitless
Diffusion coefficient of water in air	m^2 / d
Boundary layer thickness in air above soil	m
Surface Soil (assumed same for all surface soil compartments)	
Land use type	unitless

Input Parameter	Units
Water content	volume[water] / volume[compartment]
Air content	volume[air] / volume[compartment]
Soil material density	kg[soil] / m^3[soil]
Organic carbon fraction	unitless
Air soil boundary thickness	m
Default depth of runoff water	m
Fraction of area available for vertical diffusion	m^2[area available] / m^2[total]
Fraction of area available for erosion	m^2[area available] / m^2[total]
Fraction of area available for runoff	m^2[area available] / m^2[total]
Root Zone (assumed same for all root zone compartments)	
Water content	volume[water] / volume[compartment]
Air content	volume[air] / volume[compartment]
Soil material density	kg[soil] / m^3[soil]
Organic carbon fraction	unitless
Vadose Zone (assumed same for all vadose zone compartments)	
Water content	volume[water] / volume[compartment]
Air content	volume[air] / volume[compartment]
Soil material density	kg[soil] / m^3[soil]
Organic carbon fraction	unitless
Ground Water (assumed same for all ground water compartments)	
Porosity	volume[total pore space] / volume[compartment]
Air content	volume[air] / volume[compartment]
Solid material density in aquifer	kg[soil] / m^3[soil]
Organic carbon fraction	unitless
Surface Water (depends on water body type - values provided have been developed for an initial simple water body scenario)	
Flush rate	flushes/year
Suspended sediment concentration	kg[sediment] / m^3[water column]
Evaporation of water	m^3[water] / m^2[area]-day
Current velocity	m / s
Organic carbon fraction in suspended sediments	unitless
Suspended sediment density	kg[sediment] / m^3[sediment]
Boundary layer thickness above sediment	m
Drag coefficient for water body	unitless
Viscous sublayer thickness	m
pH	unitless
Chloride concentration	mg / L
Sediment (depends on associated water body type)	
Organic carbon fraction	unitless
Solid material density in sediment	kg[sediment] / m^3[sediment]
Porosity of the sediment zone	volume[total pore space] / volume[sediment compartment]
Benthic solids concentration	kg[sediment] / m^3[sediment compartment]

Input Parameter	Units
ABIOTIC CHEMICAL-SPECIFIC DATA (for each chemical)	
General to all media	
Molecular weight	g / mol
Octanol-water partition coefficient (K_{ow})	L[water] / L[octanol]
Melting point	°K
Water solubility	mol / m^3
Henry's Law constant	Pa-m^3 / mol
Diffusion coefficient in pure air	m^2 / day
Diffusion coefficient in pure water	m^2 / day
Organic carbon partition coefficient	L[water] / kg[carbon]
Surface Soil	
Methylation rate constant for Hg(2) to MHg	1 / day
Demethylation rate constant for MHg to Hg(2)	1 / day
Reduction rate constant for Hg(2) to Hg(0)	1 / day
Oxidation rate constant for Hg(0) to Hg(2)	1 / day
Root Zone	
Methylation rate constant for Hg(2) to MHg	1 / day
Demethylation rate constant for MHg to Hg(2)	1 / day
Reduction rate constant for Hg(2) to Hg(0)	1 / day
Oxidation rate constant for Hg(0) to Hg(2)	1 / day
Vadose Zone	
Methylation rate constant for Hg(2) to MHg	1 / day
Demethylation rate constant for MHg to Hg(2)	1 / day
Reduction rate constant for Hg(2) to Hg(0)	1 / day
Oxidation rate constant for Hg(0) to Hg(2)	1 / day
Ground Water	
Methylation rate constant for Hg(2) to MHg	1 / day
Demethylation rate constant for MHg to Hg(2)	1 / day
Reduction rate constant for Hg(2) to Hg(0)	1 / day
Oxidation rate constant for Hg(0) to Hg(2)	1 / day
Surface Water	
Methylation rate constant for Hg(2) to MHg	1 / day
Demethylation rate constant for MHg to Hg(2)	1 / day
Reduction rate constant for Hg(2) to Hg(0)	1 / day
Oxidation rate constant for Hg(0) to Hg(2)	1 / day
Sediment	
Methylation rate constant for Hg(2) to MHg	1 / day
Demethylation rate constant for MHg to Hg(2)	1 / day
Reduction rate constant for Hg(2) to Hg(0)	1 / day
Oxidation rate constant for Hg(0) to Hg(2)	1 / day
ABIOTIC FLOW DATA	
Total erosion rate from soil	kg[soil] / m^2[area]-day
Erosion rates between soil and soil	kg[soil] / m^2[area]-day
Erosion rates between soil and surface water	kg[soil] / m^2[area]-day
Total runoff rate from soil	m^3[water] / m^2[area]-day
Runoff rates between soil and soil	m^3[water] / m^2[area]-day

Input Parameter	Units
Runoff rates between soil and surface water	m^3[water] / m^2[area]-day
Percolation rates between soil and soil	m^3[water] / m^2[area]-day
Surface water flow between surface water compartments	m^3[water] / m^2[area]-day
Recharge from ground water to surface water	m^3[water] / m^2[area]-day
Horizontal water flow rate in ground water	m^3[water] / m^2[area]-day
Deposition of suspended sediment in the water column to the sediment bed	kg[sediment] / m^2[area]-day
Resuspension of sediment from the sediment bed to the water column	kg[sediment] / m^2[area]-day
Burial rate of sediment in the sediment bed	kg[sediment] / m^2[area]-day
BIOTIC ENVIRONMENTAL SETTING DATA (for each relevant compartment)	
ANIMALS - AQUATIC	
Water Column Carnivore - Bass	
Body weight (BW)	kg
Fraction lipid weight	unitless
Biomass per area	km / m^2
Population per area	# / m^2
Ventilation rate	ml / min / kg
Fraction of food diet comprised of fish omnivore	unitless
Fraction of food diet comprised of fish herbivore	unitless
Fraction of food diet comprised of fish carnivore	unitless
Fraction of food diet comprised of fish mayfly nymph	unitless
Water Column Herbivore - Bluegill	
Body weight (BW)	kg
Fraction lipid weight	unitless
Biomass per area	km / m^2
Population per area	# / m^2
Ventilation rate	ml / min / kg
Fraction of food diet comprised of phytoplankton (algae)	unitless
Fraction of food diet comprised of macrophyte	unitless
Fraction of diet_mayfly	unitless
Water Column Omnivore - Channel Catfish	
Body weight (BW)	kg
Fraction lipid weight	unitless
Biomass per area	km / m^2
Population per area	# / m^2
Ventilation rate	ml / min / kg
Fraction of food diet comprised of macrophyte	unitless
Fraction of food diet comprised of mayfly nymph	unitless
Fraction of food diet comprised of omnivore	unitless
Fraction of food diet comprised of fish herbivores	unitless
Benthic Omnivore	
Body weight (BW)	kg
Fraction lipid weight	unitless
Biomass per area	kg / m^2
Population per area	# / m^2

Input Parameter	Units
Ventilation rate	ml / min / kg
Fraction of diet comprised of benthic invertebrates	unitless
Benthic Carnivore	
Body weight (BW)	kg
Fraction lipid weight	unitless
Biomass per area	kg / m^2
Population per area	# / m^2
Ventilation rate	ml / min / kg
Fraction of diet comprised of benthic omnivores	unitless
Benthic Invertebrate-Mayfly	
Body weight (BW)	kg
Biomass per area	kg / m^2
Total biomass of invertebrates per area	kg / m^2
PLANTS - AQUATIC	
Macrophyte	
Biomass per area	kg / m^2
Density of macrophytes	kg / m^3
Phytoplankton - Algae	
Diameter of algae	mm
Average cell density (per vol cell, not water)	g / mm^3
Algae growth rate	1 / day
Algae density in water column	g[algae] / L[water]
Algae carbon content (fraction)	unitless
Algae water content (fraction)	unitless
ANIMALS - TERRESTRIAL	
Soil Detritivore - Earthworm	
Density per soil area, deciduous forest	kg[worm] / m^2 [area]
Density per soil area, coniferous forest	kg[worm] / m^2 [area]
Density per soil area, grass/herb	kg[worm] / m^2 [area]
Density per soil area, agriculture	kg[worm] / m^2 [area]
Density	kg[worm] / L[volume]
Water content of worm	mass fraction
Soil Detritivore - Soil Arthropod	
Body weight (BW)	kg
Biomass per area	kg / m^2
Terrestrial Ground-Invertebrate Feeder - Black-capped Chickadee	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of plants	unitless
Fraction of food diet comprised of benthic invertebrates	unitless
Fraction excretion to soil	unitless

Input Parameter	Units
Fraction excretion to water	unitless
Semiaquatic Piscivore - Kingfisher	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food comprised of water column herbivore	unitless
Fraction of food comprised of water column omnivore	unitless
Fraction of food comprised of benthic omnivore	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Semiaquatic Predator/Scavenger - Bald eagle	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of mouse	unitless
Fraction of food diet comprised of chickadee	unitless
Fraction of food diet comprised of water column herbivore	unitless
Fraction of food diet comprised of water column omnivore	unitless
Fraction of food diet comprised of water column carnivore	unitless
Fraction of food diet comprised of benthic omnivore	unitless
Fraction of food diet comprised of benthic carnivore	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Semiaquatic Piscivore - Common Loon	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of diet comprised of water column herbivore	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Semiaquatic Omnivore - Mallard	
Body weight (BW)	kg

Input Parameter	Units
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of plant	unitless
Fraction of food diet comprised of benthic invertebrate	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Predator/Scavenger - Red-tailed Hawk	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of soil arthropod	unitless
Fraction of food diet comprised of chickadee	unitless
Fraction of food diet comprised of mouse	unitless
Fraction of food diet comprised of short tailed shrew	unitless
Fraction of food diet comprised of vole	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Insectivore - Tree Swallow	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of benthic invertebrate	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Herbivore - Meadow Vole	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless

Input Parameter	Units
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of plant	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Herbivore - Long-tailed Vole	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of plant	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Predator/Scavenger - Long-tailed Weasel	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of mouse	unitless
Fraction of food diet comprised of vole	unitless
Fraction of food diet comprised of shrew	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Semiaquatic Omnivore - Mink	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of mouse	unitless
Fraction of food diet comprised of vole	unitless
Fraction of diet comprised of water column herbivore	unitless
Fraction of diet comprised of water column omnivore	unitless
Fraction of diet comprised of benthic omnivore	unitless
Fraction of food diet comprised of benthic invertebrate	unitless
Fraction of food diet comprised of chickadee	unitless
Fraction excretion to soil	unitless

Input Parameter	Units
Fraction excretion to water	unitless
Terrestrial Omnivore - White-footed Mouse	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	unitless
Water_b	unitless
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of worm	unitless
Fraction of food diet comprised of plant	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Herbivore - Mule Deer/Black-tailed Deer	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	L[water] / kg BW-day
Water_b	L[water] / kg BW-day
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of plant	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Herbivore - White-tailed Deer	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	L[water] / kg BW-day
Water_b	L[water] / kg BW-day
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of plant	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Semiaquatic Omnivore - Raccoon	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	L[water] / kg BW-day
Water_b	L[water] / kg BW-day
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day

Input Parameter	Units
Fraction of food diet comprised of benthic invertebrate	unitless
Fraction of diet comprised of water column herbivore	unitless
Fraction of diet comprised of water column omnivore	unitless
Fraction of diet comprised of benthic omnivore	unitless
Fraction of food diet comprised of worm	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Ground-Invertebrate Feeder - Short-tailed Shrew	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	L[water] / kg BW-day
Water_b	L[water] / kg BW-day
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of worm	unitless
Fraction of food diet comprised of soil arthropod	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
Terrestrial Ground-Invertebrate Feeder - Trowbridge Shrew	
Body weight (BW)	kg
Population per area	# / m^2
Soil ingestion rate	kg[soil] / kg BW-day
Water_a	L[water] / kg BW-day
Water_b	L[water] / kg BW-day
Inhalation_a	unitless
Inhalation_b	unitless
Food ingestion rate	kg[food] / kg BW-day
Fraction of food diet comprised of soil arthropod	unitless
Fraction excretion to soil	unitless
Fraction excretion to water	unitless
PLANTS - TERRESTRIAL	
Agricultural Leaf	
Water content	unitless
Lipid content	kg / kg wet weight
Correction exponent, octanol to lipid	unitless
Volume of wet leaf weight per unit area	m^3 / m^2
Density of wet leaf	kg / m^3
Mass of leaf per unit area	kg[fresh leaf] / m^2[area]
Dry mass of leaf per unit area	kg[dry leaf] / m^2[area]
Leaf wetting factor	m
1-sided leaf area index	m^2[leaf] / m^2[area]
Vegetation attenuation factor	unitless
Particle washoff rate constant	1 / day
Diffusion coefficient of water in air	m^2 / d
Date litterfall begins	MM / DD

Input Parameter	Units
Date litterfall ends	MM / DD
Date of harvest	MM / DD
Fraction of foliage harvested	unitless
Plant-air boundary layer thickness	m
Length of leaf	m
Deciduous Forest Leaf	
Water content	unitless
Lipid content	kg / kg wet weight
Correction exponent, octanol to lipid	unitless
Volume of wet leaf weight per unit area	m^3 / m^2
Density of wet leaf	kg / m^3
Mass of leaf per unit area	kg[fresh leaf] / m^2[area]
Dry mass of leaf per unit area	kg[dry leaf] / m^2[area]
Leaf wetting factor	m
1-sided leaf area index	m^2[leaf] / m^2[area]
Vegetation attenuation factor (to calc interception fraction)	unitless
Particle washoff rate constant	1 / day
Diffusion coefficient of water in air	m^2 / d
Plant-air boundary layer thickness	m
Length of leaf	m
Coniferous Forest Leaf	
Water content	unitless
Lipid content	kg / kg wet weight
Correction exponent, octanol to lipid	unitless
Volume of wet leaf weight per unit area	m^3 / m^2
Density of wet leaf	kg / m^3
Mass of leaf per unit area	kg[fresh leaf] / m^2[area]
Dry mass of leaf per unit area	kg[dry leaf] / m^2[area]
Leaf wetting factor (to calc interception fraction)	m
1-sided leaf area index	m^2[leaf] / m^2[area]
Vegetation attenuation factor	unitless
Particle washoff rate constant	1 / day
Diffusion coefficient of water in air	m^2 / d
Plant-air boundary layer thickness	m
Length of leaf	m
Herb/Grassland Leaf	
Water content	unitless
Lipid content	kg / kg wet weight
Correction exponent, octanol to lipid	unitless
Volume of wet leaf weight per unit area	m^3 / m^2
Density of wet leaf	kg / m^3
Mass of leaf per unit area	kg[fresh leaf] / m^2[area]
Dry mass of leaf per unit area	kg[dry leaf] / m^2[area]
Leaf wetting factor	m
1-sided leaf area index	m^2[leaf] / m^2[area]
Vegetation attenuation factor (to calc interception fraction)	unitless
Particle washoff rate constant	1 / day

Input Parameter	Units
Diffusion coefficient of water in air	m^2 / d
Plant-air boundary layer thickness	m
Length of leaf	m
Root - Nonwoody Only	
Wet density of root	kg / m^3
Water content of root	unitless
Lipid content of root	kg / kg wet weight
Correction exponent for octanol and lipids	unitless
Correction exponent for the differences between octanol and lipids	unitless
Total volume of dry roots in domain per unit area	m^3 / m^2
Areal density agriculture	kg / m^2
Areal density grass/herb	kg / m^2
Stem - Nonwoody Only	
Density	g / cm^3
Water content of stem	unitless
Lipid content	kg/kg wet weight
Volume of wet stem per unit area	m^3 / m^2
Density of phloem fluid	kg / m^3
Density of xylem fluid	kg / cm^3
Volume of wet weight in domain per unit area	m^3 / m^2
Flow rate of transpired water per leaf area	m^3[water] / m^2 [leaf]
Fraction of transpiration flow rate that is phloem rate	unitless
Correction exponent between foliage lipids and octanol	unitless
TEMPORAL ENVIRONMENTAL SETTING DATA	
Site-specific	
Day of first frost	unitless
Day of last frost	unitless
Deciduous Forest and Grassland	
Litterfall begin date	unitless
Litterfall end date	unitless
Uptake by leaf, end date	unitless
Uptake by root (herb/grass), end date	unitless
LAI = 0, date	unitless
Uptake by leaf, begin date	unitless
LAI = default value, date	unitless
Litterfall rate constant	1 / day
Coniferous Forest	
Uptake by leaf, end date	unitless
Uptake by leaf, end date	unitless
Litterfall rate constant	1 / day
BIOTIC CHEMICAL-SPECIFIC DATA	
ANIMALS - AQUATIC	
Water-column Carnivore - Bass	
Carnivore-omnivore partition coefficient	kg / kg
Alpha for carnivore	unitless
t_{alpha}	day

Input Parameter	Units
Assimilation efficiency	percent
Gamma	
Water-column Herbivore - Bluegill	
Herbivore-algae partition coefficient	kg / kg
Alpha for herbivore	unitless
t_{alpha}	day
Assimilation efficiency	percent
Gamma	
Water-column Omnivore - Channel Catfish	
Omnivore-herbivore partition coefficient	kg / kg
Alpha for omnivore	unitless
t_{alpha}	days
Assimilation efficiency	percent
Gamma	
Benthic Invertebrate (represented by Mayfly)	
Benthic invertebrate-sediment partition coefficient	kg / kg
Alpha for omnivore	unitless
t_{alpha}	days
Benthic Carnivore (represented by Largemouth Bass)	
Carnivore-omnivore partition coefficient	kg / kg
Alpha for omnivore	unitless
t_{alpha}	day
Assimilation efficiency	percent
Benthic Omnivore (represented by Channel Catfish)	
Omnivore-invertebrate partition coefficient	kg / kg
Alpha for omnivore	unitless
t_{alpha}	day
Assimilation efficiency	percent
PLANTS - AQUATIC	
Macrophyte	
Macrophyte-water partition coefficient	L / g
Alpha for macrophyte	unitless
t_{alpha}	days
Phytoplankton - Algae	
D_{ow}	unitless
Uptake rate	mm^2-d^{-1}-L
ANIMALS - TERRESTRIAL	
Soil Detritivore - Earthworm	
Earthworm-soil partitition coefficient, dry	mg/kg per mg/kg
t_{alpha} for worm ↔ soil	day
Alpha for worm ↔ soil	unitless
Soil Detritivore - Soil Arthropod	
Arthropod-soil partition coefficient	kg / kg wet wt
t_{alpha} for arthropod ↔ soil	day
Alpha for arthropod ↔ soil	unitless
Terrestrial Ground-Invertebrate Feeder - Black-capped Chickadee	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day

Input Parameter	Units
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Semiaquatic Piscivore - Kingfisher	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Semiaquatic Predator/Scavenger - Bald Eagle	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Semiaquatic Piscivore - Common Loon	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Semiaquatic Omnivore - Mallard	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless

Input Parameter	Units
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Predator/Scavenger - Red-tailed Hawk	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Insectivore - Tree Swallow	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Herbivore - Meadow Vole	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Herbivore - Long-tailed Vole	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Predator/Scavenger - Long-tailed Weasel	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day

Input Parameter	Units
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Semiaquatic Omnivore - Mink	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation of Hg(0)	unitless
Assimilation efficiency for inhalation of Hg(2)	unitless
Assimilation efficiency for inhalation of MHg	unitless
Terrestrial Omnivore - White-footed Mouse	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Herbivore - Mule Deer/Black-tailed Deer	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Herbivore - White-tailed Deer	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Semiaquatic Omnivore - Raccoon	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day

Input Parameter	Units
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Ground-Invertebrate Feeder - Short-tailed Shrew	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
Terrestrial Ground-Invertebrate Feeder - Trowbridge Shrew	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for MHg→Hg(2)	1 / day
First-order transformation rate constant for Hg(0)→MHg	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for Hg(2)→Hg(0)	1 / day
First-order transformation rate constant for MHg→Hg(0)	1 / day
Assimilation efficiency for inhalation for Hg(0)	unitless
Assimilation efficiency for inhalation for Hg(2)	unitless
Assimilation efficiency for inhalation for MHg	unitless
PLANTS - TERRESTRIAL	
Leaf	
First-order transformation rate constant for Hg(0)→Hg(2)	1 / day
First-order transformation rate constant for Hg(2)→MHg	1 / day
First-order transformation rate constant for MHg →Hg(2)	1 / day
Washout ratio Hg(2) vapor	unitless
Washout ratio Hg(0) vapor	unitless
Washout ratio Hg particulate	unitless
Root	
Alpha for root ↔ root-zone soil	unitless
t_{alpha}	day
Dry root/root-zone-soil partition coefficient	mg / kg per mg / kg
Stem	
Transpiration stream concentration factor	kg / m^3 per kg / m^3
Leaf Surface	
Transfer factor from leaf to leaf surface (Hg)	1 / day
Transfer factor from leaf surface to leaf (Hg particle)	1 / day

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